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EXAMINER	
NORTON, JENNIFER L	
ART UNIT	PAPER NUMBER
2121	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/26/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)
	10/783,495	CHEN ET AL.
	Examiner	Art Unit
	Jennifer L. Norton	2121

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 February 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 August 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The following is a **Non-Final Office Action** in response to the Amendment received on 21 February 2007. Claims 12, 14, 15, 17, 18, 21 and 22 have been amended. Claims 1-22 are pending in this application.

Claim Objections

2. The amendment to the claims was received on 21 February 2007. The corrections to the claims are acceptable.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4 and 9-11 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,409,538 (hereinafter Nakayama).

5. As per claim 1, Nakayama discloses a method for controlling exposure energy on a wafer substrate, comprising the steps of:

controlling the exposure energy with a feedback process control signal of critical dimension (col. 6, lines 14-20 and 48-55, col. 15, lines 12-21 and Fig. 18), and

further controlling the exposure energy with a feed forward process control signal of a compensation amount that compensates for wafer thickness variations (col. 6, lines 48-55 and col. 15, lines 14-41, i.e. "the results of the correction").

6. As per claim 2, Nakayama discloses combining the feed forward control signal with the feedback process control signal to control the exposure energy (col. 15, lines 14-33 and Fig. 18).

7. As per claim 3, Nakayama discloses supplying the feed forward process control signal by a feed forward controller (col. 15, lines 21-41 and Fig. 18, element 45).

8. As per claim 4, Nakayama discloses controlling the exposure energy by a feed forward control signal of an interlayer thickness measurement (col. 6, lines 48-55, col. 15, lines 8-28 and Fig. 18, element 56).

9. As per claim 9, Nakayama discloses calculating the compensation amount according to a polynomial function with higher order coefficients set at zero (col. 5, lines 17-32 and 38-51).

10. As per claim 10, Nakayama discloses calculating the compensation amount according to a linear function (col. 5, lines 38-51).

11. As per claim 11, Nakayama discloses calculating the compensation amount according to a segmented linear function (col. 5, lines 17-32 and 38-51).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. Claims 5-8 and 12-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakayama in view of U.S. Patent No. 6,798,529 (hereinafter Saka).

14. As per claim 5, Nakayama teaches controlling the exposure energy by a feed forward control signal of an interlayer thickness measurement (col. 15, lines 8-28 and Fig. 18, element 56).

Nakayama does not expressly teach an interlayer thickness measurement remaining after chemical mechanical planarization.

Saka teaches to an interlayer thickness measurement remaining after chemical mechanical planarization (col. 8, lines 61-63 and col. 13, lines 27-33).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Nakayama to include an interlayer thickness measurement remaining after chemical mechanical planarization to continuously and in-situ, monitor localized regions of a wafer surface during the chemical mechanical planarization process (col. 5, lines 38-40).

15. As per claim 6, Nakayama teaches calculating the compensation amount according to a polynomial function with a coefficient of the function being based on a measurement of a thickness of a planarized interlayer (col. 6, lines 35-55 and col. 15, lines 17-33).

Nakayama does not expressly teach a measurement of a remaining thickness of a planarized interlayer.

Saka teaches to a measurement of a remaining thickness of a planarized interlayer (col. 8, lines 61-63 and col. 13, lines 27-33).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Nakayama to include a measurement of a remaining thickness of a planarized interlayer to continuously and in-

situ, monitor localized regions of a wafer surface during the chemical mechanical planarization process (col. 5, lines 38-40).

16. As per claim 7, Nakayama teaches to calculating the feedback process control signal of critical dimension measurement of a layer (col. 6, lines 48-55, col. 15, lines 21-33 and Fig. 18)

Nakayama does not expressly teach calculating the feedback process control signal of critical dimension measurement of a top layer in a previous manufacturing lot.

Saka teaches to calculating the feedback process control signal of critical dimension measurement of a top layer in a previous manufacturing lot (col. 12, lines 32-35).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Nakayama to include calculating the feedback process control signal of critical dimension measurement of a top layer in a previous manufacturing lot to continuously and in-situ, monitor localized regions of a wafer surface during the critical dimension process (col. 5, lines 38-40).

17. As per claim 8, Nakayama teaches to calculating the compensation amount according to a polynomial function with a coefficient of the function being based on a measurement of a remaining thickness of a planarized interlayer (col. 6, lines 48-55) and calculating the feedback process control signal of critical dimension measurement of a layer (col. 15, lines 17-33).

Nakayama does not expressly teach a critical dimension measurement of a top layer in a previous manufacturing lot.

Saka teaches to a critical dimension measurement of a top layer in a previous manufacturing lot (col. 6, lines 58-60, col. 9, lines 28-33 and col. 12, lines 32-35).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Nakayama to include a critical dimension measurement of a top layer in a previous manufacturing lot to continuously and in-situ, monitor localized regions of a wafer surface during the critical dimension process (col. 5, lines 38-40).

18. As per claim 12, Nakayama teaches a system for controlling exposure energy on a wafer substrate, comprising:

a feed forward controller (Fig. 18, element 45) providing a feed forward control signal to an exposure apparatus based on a thickness measurement of an interlayer of the wafer substrate for controlling the exposure energy focused on a top layer of the wafer substrate (col. 15, lines 14-41), and

a feed back controller (Fig. 18, element 45) providing a feed back exposure energy control signal to the exposure apparatus based on critical dimension measurement of a layer of a wafer substrate (col. 15, lines 17-33).

Nakayama does not expressly teach a critical dimension measurement of a top layer of a wafer substrate of a previous manufacturing lot.

Saka teaches to a critical dimension measurement of a top layer of a wafer substrate of a previous manufacturing lot (col. 6, lines 58-60, col. 9, lines 28-33 and col. 12, lines 32-35).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Nakayama to include a critical dimension measurement of a top layer of wafer substrates of a previous manufacturing lot to continuously and in-situ, monitor localized regions of a wafer surface during the chemical mechanical planarization process (col. 5, lines 38-40).

19. As per claim 13, Nakayama teaches a thickness measurement device (Fig. 18, element 56) providing thickness measurement data to the feed forward controller (col. 15, lines 8-28 and Fig. 18, element 45).

20. As per claim 14, Nakayama teaches a critical dimension measurement device (Fig. 18, element 56) providing critical dimension measurement data to the feedback controller (Fig. 18, element 45 and col. 15, lines 8-28).

21. As per claim 15, Nakayama teaches a thickness measurement device (Fig. 18, element 56) providing thickness measurement data to the feed forward controller (Fig. 18, element 45 and col. 15, lines 8-28) and a critical dimension measurement device (Fig. 18, element 56) providing critical dimension measurement data to the feedback controller (Fig. 18, element 45 and col. 15, lines 8-28).

22. As per claim 16, Nakayama teaches a thickness measurement device (Fig. 18, element 56) providing thickness measurement data of a shallow trench isolation layer of the wafer substrate to the feed forward controller (Fig. 18, element 45 and col. 15, lines 8-28).

23. As per claim 17, Nakayama teaches a critical dimension measurement device (Fig. 18, element 56) providing critical dimension measurement data of a poly-gate of wafer substrates (col. 15, lines 8-17).

Nakayama does not expressly teach to critical dimension measurement data of a poly-gate of wafer substrates of a previous manufacturing lot.

Saka teaches to critical dimension measurement data of a poly-gate of wafer substrates of a previous manufacturing lot (col. 6, lines 58-60, col. 9, lines 28-33 and col. 12, lines 32-35).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Nakayama to include critical dimension measurement data of a poly-gate of wafer substrates of a previous manufacturing lot to continuously and in-situ, monitor localized regions of a wafer surface during the chemical mechanical planarization process (col. 5, lines 38-40).

24. As per claim 18, Nakayama teaches to a thickness measurement device providing thickness measurement data of a shallow trench isolation layer of the wafer substrate to the feed forward controller (Fig. 18, element 45 and col. 15, lines 8-17); and

a critical dimension measurement device (Fig. 18, element 56) providing critical dimension measurement data of a poly-gate (col. 15, lines 8-17).

Nakayama does not expressly teach to critical dimension measurement data of a poly-gate of a previous manufacturing lot.

Saka teaches to critical dimension measurement data of a poly-gate of wafer substrates of a previous manufacturing lot (col. 6, lines 58-60, col. 9, lines 28-33 and col. 12, lines 32-35).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Nakayama to include critical dimension measurement data of a poly-gate of wafer substrates of a previous manufacturing lot to continuously and in-situ, monitor localized regions of a wafer surface during the chemical mechanical planarization process (col. 5, lines 38-40).

25. As per claim 19, Nakayama teaches the feed forward controller is user configurable by having one or more polynomial coefficients set to zero in a polynomial function model (col. 5, lines 12-33 and 38-51).

26. As per claim 20, Nakayama teaches the feed forward controller is user configurable by having one or more polynomial coefficients set to zero in a polynomial function model (col. 5, lines 12-33 and 38-51).

27. As per claim 21, Nakayama teaches a system as set forth above, comprising:

a thickness measurement device (Fig. 18, element 56) providing thickness measurement data of a shallow trench isolation layer of the wafer substrate to the feed forward controller (Fig. 18, element 45 and col. 15, lines 8-28).

28. As per claim 22, Nakayama teaches a critical dimension measurement device (Fig. 18, element 56) providing critical dimension measurement data of a poly-gate of wafer substrates (col. 15, lines 8-28).

Nakayama does not expressly teach to measurement data of a poly-gate of wafer a previous manufacturing lot.

Saka teaches to critical dimension measurement data (Fig .6) of a poly-gate of wafer substrates of a previous manufacturing lot (col. 6, lines 58-60, col. 9, lines 28-33 and col. 12, lines 32-35).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Nakayama to include critical dimension measurement data of a poly-gate of wafer substrates of a previous manufacturing lot to continuously and in-situ, monitor localized regions of a wafer surface during the chemical mechanical planarization process (col. 5, lines 38-40).

29. If, however the prior art is interpreted differently by a third party, the base reference and secondary reference teach "a control signal of critical dimension" as follows:

30. Claims 1-4 and 9-11 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Nakayama in view of U.S. Patent Publication No. 2004/0092047 (hereinafter Lymberopoulous).

31. As per claim 1, Nakayama teaches a method for controlling exposure energy on a wafer substrate, comprising the steps of:

controlling the exposure energy with a feedback process control signal (col. 6, lines 14-20 and 48-55, col. 15, lines 12-21 and Fig. 18), and

further controlling the exposure energy with a feed forward process control signal of a compensation amount that compensates for wafer thickness variations (col. 6, lines 48-55 and col. 15, lines 14-41, i.e. "the results of the correction").

Nakayama does not expressly teach a "control signal of critical dimension".

Lymberopoulous teaches to a wafer measuring tool where the CD is optically measured on a patterned photoresist layer (pg. 4, par. [0036]).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Nakayama to include a wafer measuring tool where the CD is optically measured on a patterned photoresist layer to provide a simple, cost-effective methodology for fast and meaningful identification and correction of CD variation without significantly compromising throughput (pg. 2, par. [0013]).

32. As per claim 2, Nakayama teaches as set forth above combining the feed forward control signal with the feedback process control signal to control the exposure energy (col. 15, lines 14-33 and Fig. 18).

33. As per claim 3, Nakayama teaches as set forth above supplying the feed forward process control signal by a feed forward controller (col. 15, lines 21-41 and Fig. 18, element 45).

34. As per claim 4, Nakayama teaches as set forth above controlling the exposure energy by a feed forward control signal of an interlayer thickness measurement (col. 6, lines 48-55, col. 15, lines 8-28 and Fig. 18, element 56).

35. As per claim 9, Nakayama teaches as set forth above calculating the compensation amount according to a polynomial function with higher order coefficients set at zero (col. 5, lines 17-32 and 38-51).

36. As per claim 10, Nakayama teaches as set forth above calculating the compensation amount according to a linear function (col. 5, lines 38-51).

37. As per claim 11, Nakayama teaches as set forth above calculating the compensation amount according to a segmented linear function (col. 5, lines 17-32 and 38-51).

38. Claims 5-8 and 12-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakayama in view of Lymberopoulous in further view of Saka.

39. As per claim 5, Nakayama teaches as set forth above controlling the exposure energy by a feed forward control signal of an interlayer thickness measurement (col. 15, lines 8-28 and Fig. 18, element 56).

Nakayama in view of Lymberopoulous does not expressly teach an interlayer thickness measurement remaining after chemical mechanical planarization.

Saka teaches to an interlayer thickness measurement remaining after chemical mechanical planarization (col. 8, lines 61-63 and col. 13, lines 27-33).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Nakayama in view of Lymberopoulous to include an interlayer thickness measurement remaining after chemical mechanical planarization to continuously and in-situ, monitor localized regions of a wafer surface during the chemical mechanical planarization process (col. 5, lines 38-40).

40. As per claim 6, Nakayama teaches as set forth above calculating the compensation amount according to a polynomial function with a coefficient of the function being based on a measurement of a thickness of a planarized interlayer (col. 6, lines 35-55 and col. 15, lines 17-33).

Nakayama in view of Lymberopoulous does not expressly teach a measurement of a remaining thickness of a planarized interlayer.

Saka teaches to a measurement of a remaining thickness of a planarized interlayer (col. 8, lines 61-63 and col. 13, lines 27-33).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Nakayama in view of Lymberopoulous to include a measurement of a remaining thickness of a planarized interlayer to continuously and in-situ, monitor localized regions of a wafer surface during the chemical mechanical planarization process (col. 5, lines 38-40).

41. As per claim 7, Nakayama teaches as set forth above to calculating the feedback process control signal of critical dimension measurement of a layer (col. 6, lines 48-55, col. 15, lines 21-33 and Fig. 18)

Nakayama in view of Lymberopoulous does not expressly teach calculating the feedback process control signal of critical dimension measurement of a top layer in a previous manufacturing lot.

Saka teaches to calculating the feedback process control signal of critical dimension measurement of a top layer in a previous manufacturing lot (col. 12, lines 32-35).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Nakayama in view of Lymberopoulous to include calculating the feedback process control signal of critical dimension measurement of a top layer in a previous manufacturing lot to continuously and in-situ, monitor localized regions of a wafer surface during the critical dimension process (col. 5, lines 38-40).

42. As per claim 8, Nakayama teaches as set forth above to calculating the compensation amount according to a polynomial function with a coefficient of the function being based on a measurement of a remaining thickness of a planarized interlayer (col. 6, lines 48-55) and calculating the feedback process control signal of critical dimension measurement of a layer (col. 15, lines 17-33).

Nakayama in view of Lymberopoulous does not expressly teach a critical dimension measurement of a top layer in a previous manufacturing lot.

Saka teaches to a critical dimension measurement of a top layer in a previous manufacturing lot (col. 6, lines 58-60, col. 9, lines 28-33 and col. 12, lines 32-35).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Nakayama in view of

Lymberopoulous to include a critical dimension measurement of a top layer in a previous manufacturing lot to continuously and in-situ, monitor localized regions of a wafer surface during the critical dimension process (col. 5, lines 38-40).

43. As per claim 12, Nakayama teaches a system for controlling exposure energy on a wafer substrate, comprising:

a feed forward controller (Fig. 18, element 45) providing a feed forward control signal to an exposure apparatus based on a thickness measurement of an interlayer of the wafer substrate for controlling the exposure energy focused on a top layer of the wafer substrate (col. 15, lines 14-41), and

a feed back controller (Fig. 18, element 45) providing a feed back exposure energy control signal to the exposure apparatus based on a measurement of a layer of a wafer substrate (col. 15, lines 17-33).

Nakayama does not expressly teach a control signal of critical dimension and a critical dimension measurement of a top layer of a wafer substrate of a previous manufacturing lot.

Lymberopoulous teaches to a wafer measuring tool where the CD is optically measured on a patterned photoresist layer (pg. 4, par. [0036]).

Lymberopoulous does not expressly teach a critical dimension measurement of a top layer of a wafer substrate of a previous manufacturing lot.

Saka teaches to a critical dimension measurement of a top layer of a wafer substrate of a previous manufacturing lot (col. 6, lines 58-60, col. 9, lines 28-33 and col. 12, lines 32-35).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Nakayama to include a wafer measuring tool where the CD is optically measured on a patterned photoresist layer and a critical dimension measurement of a top layer of wafer substrates of a previous manufacturing lot to provide a simple, cost-effective methodology for fast and meaningful identification and correction of CD variation without significantly compromising throughput (Lymberopoulous: pg. 2, par. [0013]); and to continuously and in-situ, monitor localized regions of a wafer surface during the chemical mechanical planarization process (Saka: col. 5, lines 38-40).

44. As per claim 13, Nakayama teaches as set forth above a thickness measurement device (Fig. 18, element 56) providing thickness measurement data to the feed forward controller (col. 15, lines 8-28 and Fig. 18, element 45).

45. As per claim 14, Nakayama teaches as set forth above a critical dimension measurement device (Fig. 18, element 56) providing critical dimension measurement data to the feedback controller (Fig. 18, element 45 and col. 15, lines 8-28).

46. As per claim 15, Nakayama teaches as set forth above a thickness measurement device (Fig. 18, element 56) providing thickness measurement data to the feed forward controller (Fig. 18, element 45 and col. 15, lines 8-28) and a critical dimension measurement device (Fig. 18, element 56) providing critical dimension measurement data to the feedback controller (Fig. 18, element 45 and col. 15, lines 8-28).

47. As per claim 16, Nakayama teaches as set forth above a thickness measurement device (Fig. 18, element 56) providing thickness measurement data of a shallow trench isolation layer of the wafer substrate to the feed forward controller (Fig. 18, element 45 and col. 15, lines 8-28).

48. As per claim 17, Nakayama teaches as set forth above a critical dimension measurement device (Fig. 18, element 56) providing critical dimension measurement data of a poly-gate of wafer substrates (col. 15, lines 8-17).

Nakayama in view of Lymberopoulous does not expressly teaches as set forth

above to critical dimension measurement data of a poly-gate of wafer substrates of a previous manufacturing lot.

Saka teaches to critical dimension measurement data of a poly-gate of wafer substrates of a previous manufacturing lot (col. 6, lines 58-60, col. 9, lines 28-33 and col. 12, lines 32-35).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Nakayama in view of Lymberopoulous to include critical dimension measurement data of a poly-gate of wafer substrates of a previous manufacturing lot to continuously and in-situ, monitor localized regions of a wafer surface during the chemical mechanical planarization process (col. 5, lines 38-40).

49. As per claim 18, Nakayama teaches as set forth above to a thickness measurement device providing thickness measurement data of a shallow trench isolation layer of the wafer substrate to the feed forward controller (Fig. 18, element 45 and col. 15, lines 8-17); and

a critical dimension measurement device (Fig. 18, element 56) providing critical dimension measurement data of a poly-gate (col. 15, lines 8-17).

Nakayama in view of Lymberopoulous does not expressly teach to critical dimension measurement data of a poly-gate of a previous manufacturing lot.

Saka teaches to critical dimension measurement data of a poly-gate of wafer substrates of a previous manufacturing lot (col. 6, lines 58-60, col. 9, lines 28-33 and col. 12, lines 32-35).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Nakayama in view of Lymberopoulous to include critical dimension measurement data of a poly-gate of wafer substrates of a previous manufacturing lot to continuously and in-situ, monitor localized regions of a wafer surface during the chemical mechanical planarization process (col. 5, lines 38-40).

50. As per claim 19, Nakayama teaches as set forth above the feed forward controller is user configurable by having one or more polynomial coefficients set to zero in a polynomial function model (col. 5, lines 12-33 and 38-51).

51. As per claim 20, Nakayama teaches as set forth above the feed forward controller is user configurable by having one or more polynomial coefficients set to zero in a polynomial function model (col. 5, lines 12-33 and 38-51).

52. As per claim 21, Nakayama teaches as set forth above a system as set forth above, comprising:

a thickness measurement device (Fig. 18, element 56) providing thickness measurement data of a shallow trench isolation layer of the wafer substrate to the feed forward controller (Fig. 18, element 45 and col. 15, lines 8-28).

53. As per claim 22, Nakayama teaches as set forth above a critical dimension measurement device (Fig. 18, element 56) providing critical dimension measurement data of a poly-gate of wafer substrates (col. 15, lines 8-28).

Nakayama in view of Lymberopoulous does not expressly teach to measurement data of a poly-gate of wafer a previous manufacturing lot.

Saka teaches to critical dimension measurement data (Fig .6) of a poly-gate of wafer substrates of a previous manufacturing lot (col. 6, lines 58-60, col. 9, lines 28-33 and col. 12, lines 32-35).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Nakayama in view of Lymberopoulous to include critical dimension measurement data of a poly-gate of wafer substrates of a previous manufacturing lot to continuously and in-situ, monitor localized

regions of a wafer surface during the chemical mechanical planarization process (col. 5, lines 38-40).

Response to Arguments

54. Applicant's arguments, see Remarks pgs. 7-10, filed 21 February 2007 with respect to claims 1-4 and 9-11 under U.S.C. 102(b) have been considered but are moot in view of the new ground(s) of rejection.

55. Applicant's arguments, see Remarks pgs. 7-12, filed 21 February 2007 with respect to claims 5-8 and 12-22 under U.S.C. 103(a) have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following references are cited to further show the state of the art with respect to manufacturing semiconductors.

U.S. Patent Publication No. 2004/0267490 discloses feed forward techniques used to improve optical metrology measurements for microelectronic devices.

U.S. Patent Publication No. 2006/0154388 discloses a method and apparatus for measuring the etch depth between etching for an alternate phase shift photomask in a semiconductor photomask processing system.

U.S. Patent No. 6,773,931 discloses a method and an apparatus for dynamic targeting for a process control system.

U.S. Patent No. 6,960,416 discloses a method for controlling etch processes during fabrication of semiconductor devices.

U.S. Patent No. 6,258,610 discloses a method for analyzing a semiconductor surface having patterned features on the surface.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer L. Norton whose telephone number is 571-272-3694. The examiner can normally be reached on 8:00 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight can be reached on 571-272-3687. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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